Opening Lesson Plans to Support Teaching Innovation and Open Educational Resources Adoption

Manuel Caeiro Rodríguez
Departement of Telematic Engineering
E.E. Telecomunicación, Universidade de Vigo
Campus Universitario, S/N 36312 Vigo, Spain
+34 625.018.450
mcaeiror@gmail.com

ABSTRACT

Edu-AREA is a web 2.X application that aims at supporting teaching during the whole life-cycle of lesson plans development, from design, facilitating the creation and the re-use of previous lesson plans, activities and resources provided by other users, to monitor and reflection, enabling teachers to register all types of evidences and comments. Edu-AREA also allows users (e.g., other teachers, students, parents) to comment and provide feedback to OLP. Accounting for these pieces of feedback will contribute to the detection of problems, the adoption of innovations and the implementation of effective improvements. In addition, the development of an appropriate recognition policy (e.g. badges for teachers) and the provision of "curation" facilities will support the identification of valuable educational resources, activities and experiences. In this contribution we show the main ideas and functionalities underlying this application.

Categories and Subject Descriptors

K3.1 [Computers and Education]: Computer Uses in Education

General Terms

Experimentation.

Keywords

Lesson Plans, Open Educational Resources, Teaching Innovation, Web 2.X.

1. INTRODUCTION

A lesson plan organizes what a teacher will do and say during teaching sessions. It is a "living" artifact that needs to be prepared before teaching, and that can be evolved during its lifetime. If the lesson plan is shared with others as an Open Lesson Plan (OLP), it provides an opportunity for colleagues, supervisors and others to discuss. The OLP can be also used to monitor the teaching process and reflect about it, gathering evidences of the learning results and facilitating comments and conclusions. A good lesson plan does not guarantee the success in teaching, but without a clear plan the chances for success are greatly diminished. Similarly, the sharing, monitoring and evaluation of OLP are key to improvement and innovation. We aim at supporting teachers working and managing OLP at several stages (design, monitoring, reflection) and, meanwhile, at promoting the adoption of Open Educational Resources (OER) and pedagogical and ICT teaching innovation.

We are focused on supporting OLP at primary, secondary and pre-university education. In this context, we identify the following problems as important needs to be addressed:

- Teachers are mainly reproducers/developers of someone else lesson plans (particularly lesson plans from textbooks). They don't act as real authors or co-authors and in this way their potential contributions are missed.

- Teachers are overwhelmed by the plethora of choices related to pedagogical and ICT innovations: flipped classroom, games, social networks, virtual/augmented reality, etc. As a consequence, it is not easy for teachers to introduce such new ideas and innovations on their current practice [1].

- Similarly, OER are being promoted through many initiatives. Nevertheless, there is not good solutions that support teachers combining OER into open units (OLP) that can be treated as new OER.

To support teachers using OLP during its life-cycle, from design to enactment and beyond, we propose the development of a specific Web 2.x application (Edu-AREA, http://www.edu-area.com). Edu-AREA acronym stands for Open Experiences, Resources and Activities (in Galician language: *Actividades, Recursos e Experiencias Abertas*). It has been developed in the context of the TELGalicia research network, whose primary goal is to contribute towards the teaching innovation, mainly in primary and secondary education. Many of the ideas have also been taken from the iTEC project [2] that is focused on teaching innovation through ICT and new types of teaching activities.

Edu-AREA is proposed to allow teachers to:

1. Create and evolve their own OLP from scratch or adapting an OLP already available (e.g. created by other authors).

2. Register educational resources (e.g. contents, tools, persons, events), and discover OER and classifiers (e.g.

European Qualifications Framework) to be connected to the activities in OLP.

3. Document their teaching experiences through the registration of evidences from classroom activities and outcomes (e.g. documents produced by students, pictures) in the corresponding OLP.

4. Reflect about the development of OLP in order to improve them for the next year course.

5. Collaborate with other teachers in OLP through steps (1-4). Teachers usually feel more confident when they are supported by other teachers' experiences.

We want to support teachers on being more reflective and innovative professionals, to become responsible for their own teaching and not just reproducers of lesson plans designed elsewhere. This functionality can be provided in a simple way, without demanding extra effort for teachers and usable during class time (using a specific Android application). The goal is to increase the familiarity of teachers with evidence-based teaching and to facilitate the translation of research findings into teaching practices that enhance the quality of teaching delivered to learners [3]. The key idea is that everybody (particularly, every teacher) can contribute to teaching improvement and we want to empower them to do it. Our logo is "*Put your two cents*" ("*Aporta o teu gran*" in Galician language). This is fully aligned to the "sharing" culture underlying new society and technological developments related to Web 2.0 [4] and UNESCO OER Declaration [5]. Every teacher can become a source of information related to the resources, procedures and strategies implemented in lesson plans, both for contributing (e.g. proposing new OER) and for curating (e.g. classifying, ranking, evaluating) OLP and OER available in the system.

2. RELATED WORK

The UNESCO and other institutions, such as the MIT Open CourseWare, launched the first initiatives and proposals about OER at the beginning of this century. Nevertheless, these proposals have not gained a certain momentum until the last years. The development of participative and social Web 2.0 applications that support users as authors and "curators" of information has been adopted as a perfect marriage of the open education initiatives. Similarly, the success of Massive Open Online Courses (MOOCs) has also contributed to gather attention around this domain. Nowadays, if we search about OER repositories and related applications in the Web we can find several docents of results (take a look at http://blog.edu-area.com/abierto-frente-a-gratis-licencias-creative-commons/ to get a list or references). In the case of Spain you can find among others the following ones: Procomun (http://procomun. educalab.es/comunidad/procomun), Educared from Fundación Telefónica (http://laboratorios.fundaciontelefonica.com/), Tiching (www.tiching.com) or Didactalia (www.didactalia.net). These Web sites offer from basic educational contents to complete learning units and courses. They include functionalities to support the search and browsing of the materials in accordance to different criteria, such as educational level and subject. In some cases, they also include recommendations of similar materials. Another interesting functionality, such as in Educared, is a social network to facilitate the communication among users and the creation of communities of interest. This promotes the participation of users and therefore it is an approach to the Web 2.0 principles. In other cases, such as Tiching, information about the activities performed by other users and their ratings is provided. This kind of information can be very relevant to provide recommendations.

In addition to all these proposals and systems it is important to mention that textbook publishers. These companies are also offering Web applications and sites to support their traditional paper-based products. In this way, they are developing proprietary platforms to support digital textbooks with functionalities oriented to teachers, students and parents. Teacher functionalities may include in some cases the edition and adaptation of the materials. Nevertheless, they come from a business model that is very different to the open and social one promoted by the Web 2.0.

Despite the large amount of systems available in the Web, we consider that our proposal involves several original ideas not included in existing systems. First, we just focus on teachers and teaching. The final users of our proposal are teachers that prepare, manage, carry out, monitor and reflect about their teaching activities. From this idea, we provide a fully open and social support not just focused on contents, but in other teaching resources, particularly activities and lesson plans. These resources play a main role during the teaching process, mainly at face-to-face and blended scenarios, where the teacher has to organize and drive the teaching/learning processes. In addition, we maintain the tracking of relations among resources. This means that if a lesson plan includes some activities and if an activity includes some resources we track these relations.

3. WHAT CAN YOU FIND IN EDU-AREA?
The Edu-AREA application is organized in several areas.

3.1 Resources
The Resources section includes information records about educational resources. Each information record contains a title, an image, a description and a URI of a certain resource. This is the basic information that can be complemented with additional data such as keywords, relations to other resources and classifications. There are some key ideas about the resources section:

- Edu-AREA is conceived as a referatory [6] not as a repository. In this way, resources are not physically maintained in the system, but the URI to the real resource that will be available in an external system.

- Following the proposals of the iTEC project [2] Edu-AREA manages five different types of resources: Contents, Devices, Applications, Contributors and Trips. Contents are the typical educational resources while devices and applications are just tools that can be used during the development of an educational activity. Following this approach, Contributors is referred to people from outside the school in the role of experts or examiners that may be involved in educational activities. For example, the local police chief can talk about traffic rules, a doctor may introduce healthy habits, someone from the city hall may explain about the local government, etc. Meanwhile, Trips are referred to out of the classroom locations or events that the students may visit to support and complement teaching and learning activities.

- Different users can maintain their own information records about the same resource. This is not prohibited by the system, mainly because we consider different languages. For example, different users can have their own information record about Vimeo. In any case, we want to manage the situation in order to maintain just a reference information record by language and by resource. In this

way, when a user explores the resources section he/she will view just one information record for each real resource, the most relevant one. The other information records about the same resource will be shown when the most relevant information record is selected. In this way, a user can maintain his/her own information records about the resources of his/her interest or use the reference ones.

- Another key issue about Edu-AREA resources is that they can be abstract or concrete. An example of an abstract resource is "Image Editor", while examples of concrete resource are Gimp, Inkscape, Microsoft Paint or Photoshop. Similarly, there can be abstract and concrete resources related to Contributors (e.g., Expert, Artist, Musician) and to Trips (e.g., Museum, Exhibition, Context). This feature facilitates the classification and organization of resources in a folksonomy. Using the relations feature Edu-AREA can organize and manage different resources, their abstractions and relationships.
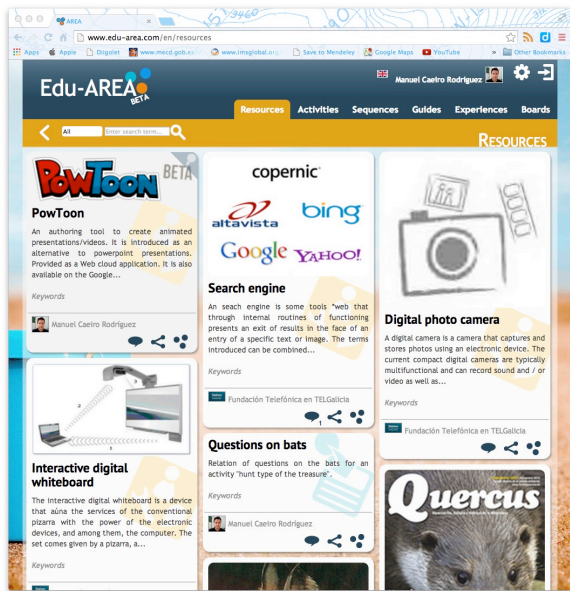

Figure. 1.   Detail of the resources section in Edu-AREA

3.2 Activities

The activities section includes information about educational activities provided to the teachers, not to learners. They contain information about the purpose of the activity and the way in which they should be carried out in the classroom. A key feature for activities in Edu-AREA is that they can include links to resources that need to or can be involved during their development. These resources can be abstract or concrete.

Activities can be conceived in an abstract or decontextualized way as they are proposed in the iTEC project [2], but they can also be very concrete. In the first case, they are not about any particular subject (e.g. the climatic change), but about a general procedure that can be applied to different subjects and topics (e.g. how to collect data from the Internet). In the case of abstract activities it is more appropriate to link abstract resources in order to support the application of the activities to different educational contexts.

Edu-AREA involves another element related to Activities: Sequences. At the current stage of development, Sequences are

just aggregations of Activities. Meanwhile Activities are conceived just for one or several sessions Sequences can involve several Activities during a larger period.

3.3 Guides

The Guides section contains the Open Lesson Plans (OLP) produced for concrete classrooms. A Guide arranges several Activities (or directly a Sequence) focused on the achievement of certain learning goals. In Guides, the Resources linked to the Activities need to be concrete. As a result, the Guide is conceived as a kind of plan that tells the teacher what he/she has to do and what resources to involve during his/her teaching.

The Guide can also include other sections with information about the technical and educational setting in which it is going to be carried out:

- The Technical Setting involves information such as the operating systems available, the LMS, the quality of the Internet connection, the applications and devices available.

- The Educational Setting involves information about the grade, subject, topic and learning goals.

This information can be relevant in order to provide recommendations to the teacher that prepares the guide about the possible resources to get involved.

3.4 Experiences

The experiences section is conceived to support teachers documenting the development of the Guide after in the classroom. In this way, Experiences in Edu-AREA need to be linked to a Guide. An experience can be viewed as a kind of teacher portfolio or as a classroom blog where the teacher monitors, including evidences such as outcomes, pictures and videos about the teaching and learning process, and reflects about the development of the teaching process. At this time, other users (e.g. learners, parents) can just introduce comments on the reflections and evidences provided by the teacher, but in the future we consider other functionalities to offer a more active role to those users.

3.5 Boards

The board section provides a kind of classification functionality where users can create their own categories and include pages from AREA related to Resources, Activities, Sequences, Guides and Experiences. This can be considered as a "curation" place, where users organize and comment the elements they find more relevant.

4. WHAT CAN YOU DO IN EDU-AREA?

In Edu-AREA, teachers can explore and view the resources and activities available, select the ones they prefer, make a copy and modify them adapting to their particular teaching context. Notice, a user cannot modify an information record that belongs to other user, but he/she can copy it and modify the copy. The tracking of copies is managed automatically. In addition, teachers can document their teaching experiences introducing evidences and reflections. Next sections introduce in more detail some particular usage scenarios.

4.1 Registering Resources

Edu-AREA users can register information records about any resource they know. A main concern about this usage scenario has been not to bother the user requiring the introduction of too many

information fields. In this way, the user is required to introduce the following fields: title, picture, description and URI. When the user provides this information the system will propose some further information fields: keywords, relations to other resources and classifications. The user can discard the suggested items and propose other information.

Another issue is related to the possibility of maintaining various information records from different users about the same real world resource. At this point we need to explain that when a user is registering a new information record for a resource the system checks if there exists some information record already. If the record is found, the system propose three options to the user: (i) to discard the suggested resource and continue registering the information record as a new object; (ii) to accept the suggested resource and to stop registering the information record; and (iii) to accept the suggested resource but to continue registering the information as a new record.

4.2 Creating Activities

Users can create information records describing activities. Activities may include different sections in accordance to different templates: iTEC [2], WebQuest, etc. For example, the iTEC template involves several sections:

- First, some initial information: name, picture, description and an URI to the original source where the activity is described outside of Edu-AREA.

- Second, pedagogical information about the learning goals and opportunities that are involved in the activity. This will be supported by a folksonomy functionality that will suggest possible items taking into account the existing ones.

- Third, guidelines specifying the several steps and actions to be done during the preparation, introduction, development, and assessment of the activities. These guidelines can be grouped into other blocks depending on the template. For example: outputs to be produced.

- Fourth, indications about what resources can be involved and how they can be used to support the activity. These resources can be abstract, indicating that different concrete resources can be involved when the activity is planned for a particular classroom. These indications and resources are suggested by the system taking into account the text introduced in the previous sections.

4.3 Creating Guides

The creation of guides involves the arrangement of several Activities and Resources to be used in a certain classroom. Edu-AREA facilitates the selection of Activities and the attachment of Resources to the Activities. This is done following the copy approach, as long as users can edit the activity descriptions in a very simple way. No specific form elements such as text boxes and text areas are included. Users can introduce the text data as it will be shown in the Web page. In addition, no option to change the font type is included, so the different records have a similar appearance. We plan to include recommendation functionalities to suggest Activities and Resources during the creation of Guides based on:

- The user profile. This is obtained indirectly from the Activities and other elements registered by the user in the system, particularly his/her boards. This provides a good view of the knowledge and interest of the user.

- The classroom context or configuration, involving both the technical setting and the educational setting information.

- The Activities and Resources included in the Guide.

Another option to create a guide is to take an existing Guide, belonging to him/herself or to other user, to copy it and perform the any edition, changes in the Activities, Resources and classroom configurations to adapt it to the user needs and interests.

5. CONCLUSIONS

We think Edu-AREA can be considered as an example of collaboration system that is egalitarian (everyone can join without any barriers to participation), meritocratic (decisions and status are merit-based rather than imposed) and self-organizing (processes adapt to people rather than people adapt to pre-defined processes). Its development based on open and social participation principles of the Web 2.0 and the OER movement is intended to capture the potential contribution of any user involved. A key point in Edu-AREA is the ownership of the information records by specific authors and the chance for anyone to create a copy for him/helself and modify it. Tracking of copies and uses is automatically managed by the system. This creates a clear and simple ownership model but also provides many opportunities for sharing and collaboration, in a similar way to solutions already available in the software domain as GitHub. Nevertheless, there are many challenges to be tackled. Control and guidance mechanisms to support the classification of the information records in accordance to a general social agreement are needed. Appropriate mechanisms for estimating the recognition of users and relevance of information records are also required.

6. ACKNOWLEDGMENTS

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